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Ms. Magalie Roman Salas  
Secretary  
Federal Communications Commission  
Room 222, Mail Stop 1170  
1919 M Street, N.W.  
Washington, DC 20554

BOSTON  
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WASHINGTON, DC

Re: Our File 09539/002001  
ET Docket No. 98-80  
Reply Comments of Adaptive Networks, Inc.

Dear Ms. Salas:

Enclosed are an original and four copies of the reply comments of Adaptive Networks, Inc. in the above-captioned proceeding.

Please contact the undersigned if you have any questions regarding this matter.

Very truly yours,

  
Keith A. Barritt

Enclosures

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Before the  
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In the Matter of )

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1998 Biennial Regulatory Review -- )  
Conducted Emissions Limits Below )  
30 MHz for Equipment Regulated )  
Under Parts 15 and 18 of the )  
Commission's Rules )  
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ET Docket No. 98-80

**REPLY COMMENTS OF**  
**ADAPTIVE NETWORKS, INC.**

Terry G. Mahn, Esq.  
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September 23, 1998

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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1998 Biennial Regulatory Review --	)	
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30 MHz for Equipment Regulated	)	
Under Parts 15 and 18 of the	)	
Commission's Rules	)	
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To: The Commission

**REPLY COMMENTS OF  
ADAPTIVE NETWORKS, INC.**

Adaptive Networks, Inc. ("Adaptive"), through counsel, submits these reply comments in the above-referenced Notice of Inquiry, FCC 98-102 (released June 8, 1998) ("NOI"). After reviewing the comments submitted in this proceeding, Adaptive believes that there is ample support for the Commission to grant carrier current systems a relaxation in both conducted and radiated emissions limits. Such relaxations will help stimulate the many Internet-related applications which carrier current technology is capable of providing for consumers and businesses throughout the country. Adaptive strongly objects to the comments submitted by the National Association of Broadcasters ("NAB") opposing any relaxation of conducted limits for carrier current systems. As shown below, NAB's objections are based on an AM radio interference study that contains the same fundamental flaws which NAB and others criticized in an earlier Commission proceeding.

**I. The 13 dB Relaxation Of Rule 15.107(d) Should Be Made Available To Carrier Current Systems**

Adaptive agrees with the comments of Interactive Technologies, Inc. that the Commission's rules should treat all powerline conducted broadband and duty-cycled emissions alike, by according carrier current emitters the same relaxation "rights" granted to all other Part 15 emitters. Nothing in the Commission's historical record supports the existing discriminatory treatment of carrier current systems and Adaptive can conceive of no technical or legal justification for denying such systems the 13 dB relaxation allowance set forth in Rule 15.107(d) and ANSI C63.4-1992. Conducted broadband and duty-cycled emissions (as compared to narrowband and CW emissions) exhibit essentially the same interference potential regardless of their source; therefore, Adaptive urges the Commission to amend Rule 15.107(d) to clarify that carrier current devices are to be included within its scope.

**II. The NAB Study And Supporting Comments Are Lacking In Technical Support**

NAB is to be commended for the good job it has done over the years in ensuring AM radio service is available to the listening public. Interference studies, such as the one commissioned for this proceeding, are useful in assisting the Commission's and the public's understanding of the problems faced by AM broadcasters. Nonetheless, Adaptive takes strong issue with the AM radio interference study submitted by NAB and the conclusions drawn therefrom. As Adaptive and other commenters made clear, the problems associated with RF interference on the powerlines arise almost exclusively from incidental radiators that

are not regulated by the Commission.<sup>1/</sup> These devices emit tens or even hundreds of millivolts of RF energy onto powerlines and are the source of the AM interference problems that NAB complains about. If these sources were required to comply with Part 15 rules instead of being exempt, carrier current manufacturers would have far less difficulty overcoming ambient noise levels.

According to the NAB study, in order to adequately protect AM radio reception, conducted emissions levels of regulated devices should be reduced 22 dB below current limits. Such a recommendation -- ten times below the existing limits -- is unreasonable, particularly since the NAB study does not address the interference from unregulated devices which are the primary source of AM interference and because the study ignores the substantial public benefits and promise of universal high speed Internet access which carrier current technologies provide. More to the point, however, this study suffers from the very same flaws which NAB itself criticized eight years ago when a similar AM radio study was presented to the Commission.

In 1990, the Consumer Electronics Group of the Electronic Industries Association ("EIA/CEG") filed a petition for rulemaking seeking clarification of the carrier current regulations as they applied to the CEBus encoder.<sup>2/</sup> Echelon Corporation, which opposed the EIA/CEG petition, submitted a study in that proceeding which purported to show how the CEBus encoder would interfere with AM radio reception. NAB analyzed the study and

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<sup>1/</sup> See, e.g., Interactive Technologies, Inc. Comments, ET Docket No. 98-80, at 7; Silicon Graphics Comments, ET Docket No. 98-80, at 1; Sensormatic Electronics Corp. Comments, ET Docket No. 98-80, at 2.

<sup>2/</sup> Petition for Rule Making, RM-7296 (filed Feb. 16, 1990).

found it seriously flawed. In an observation that applies equally to its own study, NAB stated that the Echelon study "unfairly characterize[s] the true performance" of the carrier current device under test.<sup>3/</sup> Actually defending EIA/CEG's request for higher limits in the AM band, NAB was highly critical of the Echelon study for:

- using a simulated interfering signal that inaccurately depicted the true composition of spurious signals generated by the carrier current device;
- using a test signal of questionable validity as an accurate representation of the actual interference produced by the carrier current device at the test frequency; and
- using a Line Impedance Stabilization Network ("LISN") test port to represent a valid line interface.<sup>4/</sup>

To further combat the Echelon study, EIA/CEG commissioned AT&T Bell Laboratories to conduct tests to evaluate the study results. Based on these tests, EIA/CEG agreed with NAB that such a methodology was seriously flawed, concluding that "real-world conditions present an event smaller risk of interference" because:

- a LISN isolates all the noise ordinarily on the powerline that will "hide" the carrier current signal from AM radio;
- the test conditions (unfairly) assumed continuous operation of the carrier current device;
- the test did not take into account that carrier current signal strength attenuates as the distance between the source and the radio increases; and
- the use of a sine wave instead of a digital signal distorts the results by concentrating energy in a particular frequency, thereby increasing its interference potential.<sup>5/</sup>

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<sup>3/</sup> NAB Comments, RM-7296, at 3.

<sup>4/</sup> NAB Comments, RM-7296, at 3-5.

<sup>5/</sup> EIA/CEG Reply Comments, RM-7296, at 14-15.

Notwithstanding the foregoing criticisms of the flawed procedures and misleading results, NAB now submits a study in this docket which is remarkably similar to Echelon's. NAB's study, for example, uses an AM carrier modulated at 400 Hz as a test signal, tunes it to the AM radio band, and interfaces it into the LISN test port. As NAB remarked earlier, such testing "unfairly characterizes" the true nature and interference potential of the spurious signals generated by carrier current devices.

Moreover, if the test methodology used by Echelon, and now NAB, could not accurately measure the true interference potential of a known device like the CEBus encoder, how can it possibly predict the interference potential of the dozens of different types of carrier current technologies currently on the market or under development?

Adaptive, for example, uses a digital carrier that is three orders of magnitude wider and a modulation scheme fundamentally different than the one used in the NAB study. No "tone" in the Adaptive system would reside in the AM band as required by the NAB study, and thus its conclusions are inapplicable to this type of broadband system. For these reasons, the study and NAB's supporting comments should be dismissed by the Commission as flawed and not technically useful in this proceeding.

NAB also asks the Commission to eliminate the distinction between Class A and Class B emissions on the shaky premise that 21% of radio listening occurs other than "at home or inside a vehicle." Even if true, these statistics do not mean that such listening occurs in commercial or industrial environments. Outdoor AM radio listening (e.g. parks, playgrounds, work sites) is most likely what the survey shows, since AM radio experiences drastically degraded reception in commercial environments due to building attenuation and a

multitude of local interference sources, like fluorescent lighting, machinery, and other equipment which have conducted emissions limits 10 dB or more above the limits permitted for residential products. Thus, it is highly doubtful that tighter conducted limits in Class A environments could have any measurable impact on AM interference and, therefore, the Commission should reject NAB's suggestions. Instead, carrier current systems marketed in these environments should be given the same 10 dB allowance accorded to other digital devices.

### **III. Conclusion**

Adaptive is sensitive to the concerns of AM broadcasters and listeners. However, these concerns should be addressed to the real polluters of the AM radio spectrum, the incidental radiation devices. Carrier current technology holds the promise of bringing high-speed Internet access to consumers, businesses and rural areas. Adaptive believes that the comments filed in the proceeding support its recommendations for a relaxation in both conducted and radiated limits to stimulate the development and use of these applications. Accordingly, Adaptive urges the Commission to (i) permit the same 13 dB relaxation in conducted limits for carrier current broadband emissions that is currently permitted for all other unintentional emitters, (ii) relax radiated limits below 30 MHz by 6 dB to enable rural access for carrier current-based services, and (iii) relax both radiated and conducted limits for commercial/industrial carrier current systems by an additional 10 dB above existing limits.



Respectfully submitted,

A handwritten signature in black ink, appearing to read "Keith A. Barritt", with a long horizontal flourish extending to the right.

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